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STATISTICAL BULLETIN

Metropolitan Life Insurance Co.

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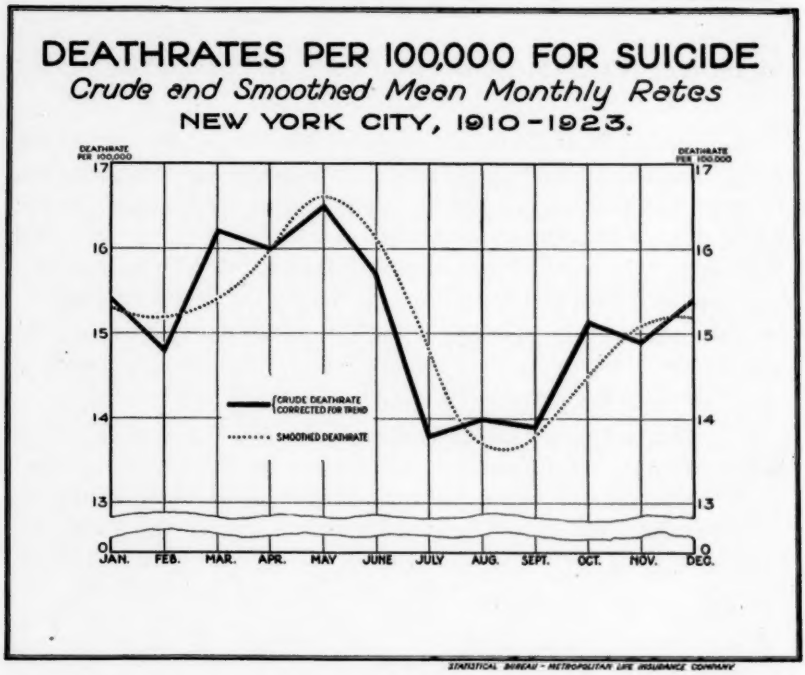
SEASONAL VARIATION OF SUICIDES IN NEW YORK CITY, 1910 TO 1923.

Suicides in New York City occur most frequently during the spring months of the year; in May, when the maximum rate is reached, the mortality is ten per cent. above the average for the whole year. Minimum deathrates are observed in August and September. In these summer months, the suicide rate is nine per-cent. below the annual average; with the advent of colder weather, the rates rise sharply, and for the winter months remain at about the average for the year. The seasonal swing in suicide frequency is set forth in the following table and in the chart on page 2.

Mortality from Suicide—New York City, 1910-1923. Mean Monthly Deathrates per 100,000 for the Period: (a) Crude; (b) Corrected for Trend; and (c) Smoothed to Show Normal Periodic Flow of the Suicide Deathrate During the Year.

MONTH	Mean Death-rate	Crude Seasonal Index of Deathrate	Mean Death-rate Corrected for Trend	Periodic Curve Values of Corrected Deathrate	Seasonal Index of Periodic Values
	1	2	3	4	5
January	15.6	103	15.4	15.3	101
February	14.9	98	14.8	15.2	100
March	16.3	108	16.2	15.4	101
April	16.1	106	16.0	16.0	106
May	16.6	110	16.5	16.6	110
June	15.8	104	15.7	16.1	107
July	13.8	91	13.8	14.8	97
August	13.9	92	14.0	13.7	91
September	13.9	92	13.9	13.8	91
October	15.0	99	15.1	14.5	96
November	14.7	97	14.9	15.1	99
December	15.2	100	15.4	15.2	101
MEAN ANNUAL	15.1	100	....	....	100

The means of the monthly rates are shown in column (1) and the crude seasonal indices, *i.e.*, the ratios of rates for single months to the mean annual rate, are given in column (2). The figures in this column are affected, however, by the long-time downward swing of the rates, amounting, in this case, to about two and one-half per cent. per year. Correction for this factor of secular trend results in the figures shown in column (3), which are still crude, unsmoothed values. By a suitable process of passing a curve* among these crude



readings, the graduated values in column (4) were obtained. By relating these smoothed values of the suicide deathrate to the mean annual rate, the final index figures in column (5) were obtained.

It is thought that the processes of correcting for the long-time downward swing of the deathrates, and of passing a smooth curve among the corrected values, results in a close approximation to the fact of seasonal swing in suicide frequency.

The present note is part of a study of the seasonal variation of suicide in various parts of the United States Registration Area, and

*The mean values of the suicide deathrate for the months, corrected for secular trend, were fitted to a periodic sine-cosine curve of the form: $y=a+b \sin x+c \cos x+d \sin 2x+e \cos 2x+f \sin 3x+g \cos 3x$. *See Whittaker and Robinson*, "Calculus of Observations," page 260 *et seq.*

this, in turn, is a section of a broader inquiry into the various aspects of suicide and of suicide prevention as a life insurance problem. Quotations from this study have been made previously* on the relation of suicide to business and employment conditions. The departures of suicide frequency from the annual norms in these areas will be studied closely in order to check the observations of DURKHEIM, MORSELLI and others. The statistics of suicide offer opportunity for distinct contributions to positive psychiatry. In the present figures for New York City there seems to be an indication for higher-than-average suicide rates to occur in months having the highest range between maximum and minimum temperatures. This bears out MORSELLI'S contention that suicide rates tend to be high in months when the organism as a whole is not yet acclimatized to changed and changing weather.

In the final study, which is now in preparation, further tests of the several hypotheses in respect to suicide and season of the year will be made.

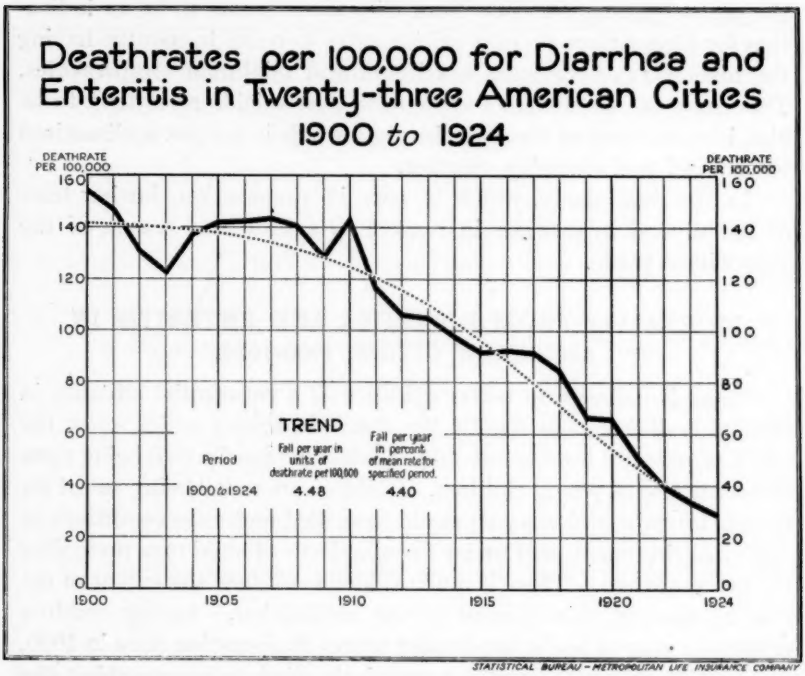
MORTALITY FROM DIARRHEA AND ENTERITIS IN AMERICAN CITIES, 1900-1924.

There is perhaps no better evidence of a substantial advance in standards of American family life than the figures which show the effect of parental intelligence and of enhanced family well-being upon the deathrate of young children. Children are today being saved for lives of future usefulness who would have died under the conditions of family environment, and under the standards of child care prevailing twenty years ago. There is much evidence to show the extent of the real advance in this element of our civilization. Among children under one year of age in the United States Registration Area in 1900, nearly 17 per cent., or about one-sixth, died before reaching the second birthday. In 1922, the mortality among these babies was 8 per cent.! Two decades ago, more than 2 per cent. (2.1), died each year at the ages between one and five. In recent years, this death-toll has declined to much less than 1 per cent. (.7) of this child population each year.

Perhaps the best evidence of an advance in parental intelligence and in family welfare is the declining deathrate for diarrhea and enteritis. The diseases included under this heading in mortality statistics are, for the most part, due to the improper care and feeding of children. Unquestionably, most of the intestinal disorders of

*_Statistical Bulletin_, Metropolitan Life Insurance Company, December, 1924 and May, 1925.

children can be prevented. The infant who has an abundance of airspace in the home, with plenty of sunlight, who is clothed to suit the weather, kept scrupulously clean, and who is fed in accordance with the simple, commonsense directions of the family physician, is almost certain not to develop the intestinal disorders which, twenty years ago, carried off so many very young children. That these precepts of child care are today much more generally practiced in American homes is shown by the fact that the modern infant is



only one-fifth as likely to die of some intestinal disease as was the baby who lived two decades ago. In 1900, in twenty-three American cities, the diarrhea and enteritis deathrate was 154 per 100,000 of population; in 1924, the figure was 29 per 100,000! The foregoing chart shows the progress made during the past twenty-five years in arresting this cause of needless mortality.

The trend line shows that progress was slow during the early years of this century. For the first eight years, there was a fall of only ten points in the deathrate. Beginning with 1908, however, the country-wide extension of child-hygiene precepts and practices, as put into effect by the Departments of Health of the states and of

their minor civil divisions, began to affect the deathrate appreciably. From 1908 onward, there was a rapid downward sweep of the line representing deathrates for diarrhea and enteritis. Computing from the trend line, there was a fall of 78 per cent. in the diarrhea and enteritis deathrate between 1908 and 1924!

What of the future? An estimate from a continuation of the trend line suggests further progress during the next few years until a mortality figure of approximately 10 per 100,000 is reached in 1930, with not much decline from this rate for ensuing years. The complete eradication of fatal intestinal disorders of infants is, of course, impossible; but effort should be expended to approach and to maintain the lowest attainable level of the deathrate.

EXTENT OF USE OF INSULIN IN DIABETES MELLITUS. AN ANALYSIS OF 1,800 FATAL CASES.

Few data are available concerning the extent to which insulin is used at present in the treatment of diabetes mellitus. To obtain these facts, the Metropolitan Life Insurance Company has been sending letters to physicians who reported the cause of death of policyholders as diabetes mellitus. The following observations are based upon the replies in 1,800 fatal cases of diabetes among Industrial policyholders during the twelve months February, 1924 to February, 1925.

Insulin, for various reasons, is not used in all cases of diabetes. Fortunately, however, there is good evidence that its use is increasing. We found that only 881, or less than half, had received insulin at any time.

Further analysis showed that the use of insulin is more general in urban centers than in rural communities. For the entire group of cases where the physicians were located in cities, more than half (51 per cent.) of the cases received insulin. In the smaller cities, however (population 10,000 to 25,000), insulin was given to only 42 per cent. of the cases, while in distinctive rural areas only a little more than 40 per cent. of the cases were so treated. The reason for this difference is explained probably by the presence in large cities of well-equipped hospitals where the knowledge and facilities for such treatment are available.

That the better showing for the large cities is due to the presence of hospitals there is no doubt. These institutions, we found, provided insulin to three-quarters of the diabetes cases treated, whereas only 36 per cent. of those that died at home received this treatment.

Young persons were given insulin more extensively than older persons. In this group over 70 per cent. of those less than 45 years of age received insulin; slightly more than half those between 45 and 64 years of age were so treated; and less than a third of those 65 years of age and over. The small ratio in the older ages may be explained by the fact that dietetic methods are found to give more satisfactory results in these cases than in younger persons. It is interesting to note that insulin was administered without distinction of race or sex; the ratio treated with insulin was substantially the same for white and colored and for males and females.

The outstanding observation in this study is that insulin was given in the majority of cases in the very last stages of the disease. Over half the cases (54.6 per cent.) commenced the treatment less than a month before death. It is amazing to learn that about 17 per cent. of those who received insulin, commenced the treatment on the very day they died, or but one day before.

In a number of cases the physicians reported that insulin treatment had been started but discontinued later by the patient. The diabetic, it seems, gains confidence with the use of insulin, for the uncomfortable symptoms of the disease disappear very rapidly; and the patients in many instances are able to again resume their usual vocations. Insulin, however, is not a *cure*; and this the patient often overlooks, despite the admonitions of his physician. Against warnings of dire consequences, these persons frequently partake of forbidden foods. A relapse which results fatally, frequently follows.

Death was rarely due to diabetes alone. In 97 per cent. of the 1,800 cases studied, diabetes was accompanied by at least one terminal condition. Coma occurred most frequently and was present in substantially half the fatal cases. Arteriosclerosis was a complication in 28 per cent. of the cases, gangrene in 26 per cent., and chronic nephritis in 24 per cent. It is apparent that in a large number of cases the complicating disease in itself was serious enough to cause the death of the patient.

In view of the frequent occurrence of coma, the cases with this condition are of particular interest. It is the opinion of leading diabetic specialists that insulin should be given in all cases of diabetic coma, and so we found that this type of case was given insulin to a greater extent than were those uncomplicated by coma. Sixty-two per cent. of the diabetic cases with no complication other than coma were given insulin. In those cases where, in addition to coma, another complication was present, about 53 per cent. received insulin.

But in those cases in which coma was absent only 44 per cent. were given insulin. It may also be remarked here that 76 persons who died from diabetes, complicated, according to the reports, by nothing but coma, did not receive a single insulin treatment.

A REVISED MANUAL OF JOINT CAUSES OF DEATH.

The Bureau of the Census has just published the second edition of its "Manual of Joint Causes of Death." This will now displace the first edition issued in 1914. The earlier volume was the real pioneer step in America toward a uniform methodology in classifying, for purposes of mortality statistics, all reports in which more than one disease is returned as a cause of death. The new Manual has one distinct advantage over its predecessor, in that it makes possible a definite classification for *any* binomial combination of reported diseases. Those using the former often failed to find the combination of causes for which they were searching.

The necessity for a Joint Cause Manual arises from the following:

(1) It is impracticable for registration offices to publish every year tables which are based on more than a single cause for each death. The expense attendant on the compilation of such complex tables would be prohibitive, and there would be so much delay in completing the reports that they would lose all the value which comes from timeliness.

(2) Hence polynomial reports must be classified on a monomial basis. This entails a process of selection in deciding on the *one* disease to which a death is to be charged.

(3) To bring about comparability of the figures issued by different compiling offices, the same method of selecting these "preferred causes" should be followed by all.

Twenty-five years ago the late WILLIAM A. KING, then Chief Statistician for Vital Statistics, said of jointly reported causes of death: "This is one of the most annoying and difficult subjects for a wholly satisfactory solution that occurs in the practical compilation of mortality statistics." In the very nature of things its "satisfactory solution" is much more difficult now than during Mr. KING'S life. The reason is that the campaign of the past quarter of a century, which National, state, municipal and insurance statistical offices have carried on to obtain more accurate statements of causes of death, has been effective in getting most physicians to report in greater detail than two decades ago. The very improvement of these basic data, however, has made increasingly difficult the work of compiling

offices because there are more binomial and polynomial returns. It will be readily seen, then, how useful a purpose the new "Manual of Joint Causes of Death" serves.

Obviously, the classification of jointly reported causes of death is anything but an exact science. Very radical differences of opinion as to the allocation of certain combinations might well arise among the very best authorities on the subject. Recognizing this, Dr. WILLIAM H. DAVIS, Census Bureau Chief Statistician for Vital Statistics, has very frankly asked for constructive criticism of the volume by vital statisticians.

This subject of the classification of jointly returned causes of death, we may add, has been passed over entirely too lightly at every one of the decennial meetings of the Commission for the Revision of the International List of Causes of Death. At the latest meeting, at Paris in 1920, the subject received only passing comment instead of the thoughtful consideration it deserved. The foremost object of these decennial meetings, in which delegates from most of the countries of the civilized world participate, is to bring about similar methods, in all countries, for the statistical classification of causes of death. In America, it has been estimated that two or more causes of death are certified on at least forty per cent. of the death certificates. If anything like this ratio prevails in the other countries it is obvious that we cannot hope for real comparability of international mortality statistics unless this subject receives more serious consideration at the hands of the next international conference.

The new Census Manual, in its attempt to simplify and systematize codifying practice is a definite forward step. We recommend that all statistical offices of health departments, insurance companies and other organizations which compile mortality statistics from original sources use this manual and be guided by the decisions made therein.

HEALTH RECORD FOR JULY, 1925.

The July deathrate of the Industrial populations of the United States and Canada was more favorable than in any prior month of 1925. The rate (8.1 per 1,000) which prevailed among the Industrial policyholders of the Metropolitan Life Insurance Company compares favorably with the figures for July of previous years. In 1924, the figure for that month was 8.6 and in 1923 it was 8.4.

Heart disease, the leading cause of death, with a rate of 108.0 per 100,000 showed a marked reduction as compared with June and a slight decline from last year's July figure. July rates for the other

"degenerative diseases," cerebral hemorrhage and Bright's disease, were also lower than in 1924.

Tuberculosis, with a rate of 95.6 per 100,000, recorded for the seventh successive time this year, a lower deathrate than for the corresponding month of 1924. Unless there shall be an unexpected, and a sharp, change in the tendency of the tuberculosis deathrate during the remainder of 1925, the year will register a new minimum in the mortality from this disease.

The situation for the principal epidemic diseases of childhood continues very favorable, the combined deathrate showing a marked decline as compared with July, 1924. The rate for diarrheal diseases (40.6 per 100,000) is higher than for the same month of last year and two years ago. This is due more to a considerable increase in the number of infants exposed to risk than it is to actual increase in the prevalence of diarrheal complaints. Pneumonia and influenza show a seasonal decline as compared with the preceding month and the combined total of the two diseases shows improvement over 1924. Deaths from puerperal conditions also were fewer than at this time last year.

The number of deaths during July by accidental means showed a reduction as compared with the same month of 1924. There was even a small decline reported for automobile fatalities; and it has been seldom, indeed, that we have been able to report improvement for this class of accidents when comparing any year with a previous one. The decline is small and little significance attaches to it. Very possibly, it is only a transitory variation from what has happened during the rest of the year.

The general deathrate for the large cities of the United States in July was 10.8 per 1,000, which is a marked improvement over the June record. Only three diseases—malaria, poliomyelitis, and typhoid fever—were more prevalent than in June. More or less important declines were recorded in case reports of diphtheria, influenza, measles, scarlet fever, smallpox and whooping cough. Compared with July, 1924, there was increased prevalence of poliomyelitis, typhoid fever and whooping cough; but there was less diphtheria, influenza, malaria, measles, scarlet fever and smallpox.

Scarlet fever cases were fewer in most of the states tabulated. In Illinois, there were only 357 cases reported in the first four weeks of July, as compared with 914 cases in June; in Massachusetts, the cases declined from 953 to 414. Measles was much less prevalent in July, the most notable examples of lower incidence of this disease

being Michigan, in which case reports declined from 2,073 in June, to 509 in July, and Wisconsin, where the drop was from 1,336 to 455. Diphtheria declined slightly.

Smallpox was much less prevalent in July and this applies particularly to Alabama, Illinois, Texas, North Carolina, and Wisconsin. Cases continue to be reported from Jersey City, and in Chicago the Health Commissioner requested an appropriation of $25,000 to combat the threatened spread of this disease. It is reported that in a section of Cleveland 3,000 persons were quarantined, due to the presence of nine cases of smallpox in the district; also, that, after a canvass of the section, persons not showing satisfactory evidence of vaccination were quarantined or kept in quarantine for a period of possible development of the disease.

There was increased prevalence of typhoid fever as compared with June; but such an increase is expected at this time of the year. Outbreaks in Nyack, New York and Hackensack, New Jersey, were traced to drinking of impure spring water. A contaminated water supply is said to be responsible also for 100 cases of typhoid, which followed closely upon the annual conference of a religious denomination at Winona Lake, Indiana.

The outbreak of supposed dengue fever at Chester, Pennsylvania, to which we referred in the July BULLETIN, now appears to have been caused by a milk-borne infection of the streptococcic type. Dengue was actually present, however, in Georgia, Alabama, Oklahoma and Texas.

A death from typhus fever occurred in Maryland and cases were reported in July from Texas and Georgia. Leprosy cases were reported from Stockton and Fresno, California, and from Texas and Louisiana.

Among the outstanding public health activities of the month, the following may be mentioned: The Pennsylvania Department of Health has placed in operation a plan through which it hopes to have every child in five counties physically fit on entering school next fall. A health and dental motor car has been visiting these counties this summer. Due to an outbreak of rabies in animals in New Mexico, during the first three weeks of July, a quarantine was placed on all dogs in Chaves County. In one Maryland town, orders were issued to shoot unleashed dogs on sight, in view of the large number reported as having rabies.

The following table shows the mortality among Industrial policyholders for July, 1925; June, 1925; July, 1924, and the year 1924.

METROPOLITAN LIFE INSURANCE COMPANY.

Deathrates* per 100,000 for Principal Causes, Premium-paying Business in Industrial Department. (Annual Basis.)

MONTHS OF JUNE, 1925; JULY, 1925, AND OF JULY, 1924.

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED*			
	July, 1925	June, 1925	July, 1924	Year 1924
TOTAL—ALL CAUSES	810.5	938.7	857.5	905.2
Typhoid fever	5.2	3.0	4.3	4.4
Measles	3.9	7.0	3.7	7.2
Scarlet fever	2.2	3.4	3.5	4.4
Whooping cough	8.1	8.9	8.5	7.4
Diphtheria	6.6	8.2	7.8	13.1
Influenza	6.8	12.9	5.1	16.0
Tuberculosis (all forms)	95.6	106.5	102.3	104.2
Tuberculosis of resp'y system	84.0	91.7	90.0	92.3
Cancer	68.1	68.7	72.4	70.2
Diabetes mellitus	12.7	14.9	12.5	14.8
Cerebral hemorrhage	46.7	51.3	54.2	60.1
Organic diseases of heart	108.0	134.4	111.7	123.4
Pneumonia (all forms)	40.4	74.2	47.6	88.6
Other respiratory diseases	8.5	12.0	11.8	13.8
Diarrhea and enteritis	40.6	31.0	35.8	32.2
Bright's disease (chronic nephritis)	59.5	72.9	61.4	65.3
Puerperal state	14.7	17.2	15.4	16.8
Suicides	7.1	6.5	6.0	7.2
Homicides	6.6	7.1	9.3	7.1
Other external causes (excluding suicides and homicides)	73.5	88.3	84.5	62.5
Traumatism by automobile	17.9	15.9	18.3	15.7
All other causes	196.0	210.3	199.7	186.5

*All figures include infants insured under one year of age.

Correspondence on the subjects discussed in these BULLETINS, may be addressed to: The Editor.

STATISTICAL BULLETIN,
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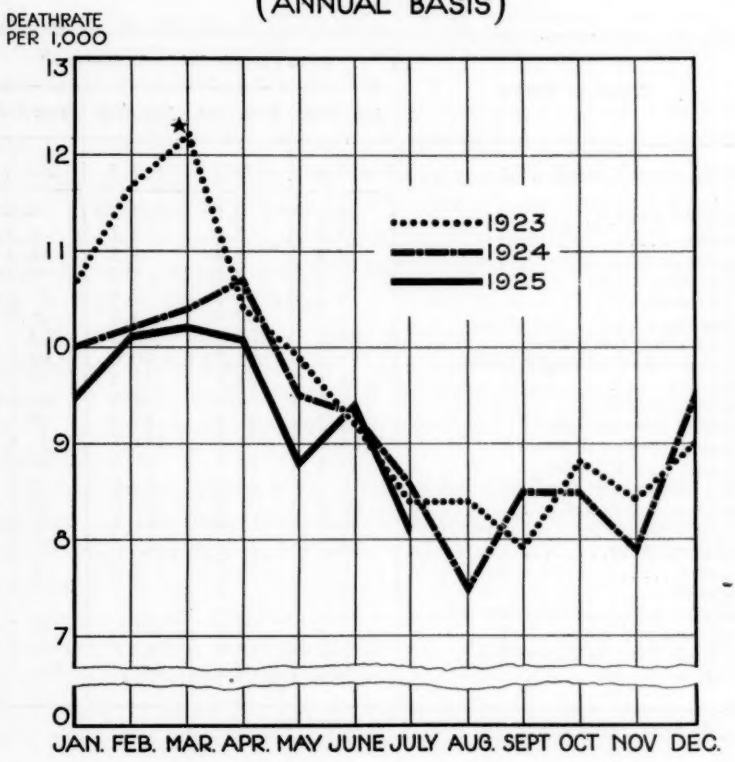
DEATHRATE PER 1000 *in* SPECIFIED MONTHS *of* 1923, 1924, 1925

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
(ANNUAL BASIS)



	1923	1924	1925		1923	1924	1925
JAN.	10.7	10.0	9.5	JULY	8.4	8.6	8.1
FEB.	11.7	10.2	10.1	AUG.	8.4	7.5	
MAR.	12.2	10.4	10.2	SEPT.	7.9	8.5	
APR.	10.4	10.7	10.1	OCT.	8.8	8.5	
MAY	9.9	9.5	8.8	NOV.	8.4	7.9	
JUNE	9.2	9.3	9.4	DEC.	9.0	9.5	

★ *Beginning with March, 1923, figures include mortality of infants under one year of age.*

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